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TITLE: ORGANIC THIN FILM RECTIFYING DEVICE
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INVENTOR-INFORMATION:

NAME

MOTOMA, NOBUHIRO
MIZUSHIMA, KOICHI
AZUMA, MINORU
MIURA, AKIRA

ASSIGNEE-INFORMATION:

NAME

TOSHIBA CORP

COUNTRY

N/A

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ABSTRACT:

PURPOSE: To facilitate extremely high speed switching operation by a method wherein an organic thin film in a junction structure of metal/organic thin film/ metal is composed of a laminated structure of thin films containing donor type organic molecules and thin films containing acceptor type organic molecules to provide rectifying characteristics.

CONSTITUTION: 10 layers of LB films 2 made of tetrathiafulvalene (TTF) as a

donor type molecule are formed on an Al substrate 1 and 10 layers of LB films 3 made of tetracyanoquinodimethane (TCNQ) as an acceptor type molecule are formed on the films 2. An Al electrode 4 is formed on the films 3 by evaporation. When a bias is zero, the ionizing potential IPD of the LB film 2 containing donor type molecules is small and the electron affinity EA of the LB film 3 containing acceptor type molecules is large and difference between those two values is, for instance, less than about 1eV. When a forward bias is applied, electron transition from the electron conditions of the LB film 2 to the electron conditions of the LB film 3 is induced and a forward current is applied. When a reverse bias is applied, potential barrier between the electron conditions of the LB film 3 and the electron conditions of the LB film 2 is high so that no electron transition is induced and hence no current is applied.

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